

REMARKS

Favorable reconsideration and withdrawal of the objections and rejections set forth in the above-mentioned Official Action in view of the foregoing amendments and the following remarks are respectfully requested.

Drawings

Figures 1 and 4 are objected to for the reasons set forth in the Official Action.

Figure 15 is also objected to because it is not labeled --PRIOR ART.

In response, a Submission of Corrected Sheets of the Drawings is being filed concurrently herewith in which the legend “/LEDON” has been changed to --LED ON-- in Figure 1 and 4; and the label --PRIOR ART-- has been added to Figure 15. It is respectfully submitted that no new matter has been added and that the objections to the drawings has been overcome.

Title

The title has been objected to as not being descriptive. In response, a new title, which is more clearly indicative of the claimed invention, is presented herein for the Examiner's consideration and approval.

Specification

The specification has been amended to place it in better form. Again, it is respectfully submitted that no new matter has been added.

Claims Status

Claims 1 through 11 remain pending in the application. Claims 12 through 17 have been canceled. Claims 1 through 3, 5 through 9, 10, and 11 have been amended to even more succinctly define the invention and/or to improve their form. Again, it is respectfully

submitted that no new matter has been added. Claims 1, 5, 6, and 11 are the only independent claims pending in the application.

Claim Objection

It is acknowledged with appreciation that Claim 8 is merely objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claims and any intervening claims. The claim remains in its dependent form, inasmuch as it is believed that Claim 1 from which it depends will be found to be allowable.

Art Rejections

Claims 1, 5, 6, and 11 are rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,397,018 (Matsumoto, et al.).

Claims 2 and 7 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto, et al. in view of Japanese Patent Document No. 2001-228698 (Mukohara).

Claims 3, 4, 9, and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Matsumoto, et al. in view of U.S. Patent No. 6,535,699 (Abe, et al.).

The rationale underlying the foregoing art rejections is succinctly set forth in the Official Action.

Response to Art Rejections

The rejections are respectfully traversed.

Amended Claim 1 calls for an image forming apparatus to which a developing apparatus for developing a latent image on an image bearing member corresponding to image information is detachably attachable that includes a first detection device for presuming a remaining amount of the developer in the developing apparatus based upon

the image information; a second detection device for detecting a remaining amount of the developer in the developing apparatus; and a processing unit for determining an indicating level of remaining amount of the developer in the developing apparatus based upon results of detection of the first detection device and the second detection device. In a case that the first remaining amount of the developer presumed by the first detection device is equal to or less than an amount defined as a predetermined amount, and the second remaining amount of the developer detected by the second detection device is equal to or more a predetermined amount, the indicating level determined by the processing unit of the remaining amount of the developer in the developing apparatus is different from both an indicating level according to the first remaining amount of the developer by the first detection device and an indicating level according to the second remaining amount of the developer detected by the second detection device.

Amended independent Claim 5 is a control method claim for an image forming apparatus generally formulated on the basis of amended Claim 1.

The invention recited in amended Claims 1 and 5 is characterized in that in a case that the first remaining amount of the developer presumed by the first detection device is equal to or less than an amount defined as a predetermined amount, and the second remaining amount of the developer detected by the second detection device is equal to or more than a predetermined amount, the indicating level determined by the processing unit of the remaining amount of the developer in the developing apparatus is different from both an indicating level according to the first remaining amount of the developer by the first detection device and an indicating level according to the second remaining amount of the developer detected by the second detection device.

Amended Claim 6 calls for an image forming apparatus to which a developing apparatus including a developer carrying member for developing a latent image on an image bearing member is detachably attachable. The apparatus includes a first detection device for detecting a utilized amount of the developer of the developing apparatus; a second detection device for detecting a remaining amount of developer in the developing apparatus; and a processing unit for determining an indicating level of a utilized amount of the developing apparatus based upon results of detection of the first detection device and the second detection device. In a case that the utilized amount of the developer carrying member detected by the first detection device is equal to or less than a predetermined amount, and the remaining amount of the developer detected by the second detection device is equal to or more a predetermined level, the indicating level of a utilized amount of the developing apparatus determined by the processing unit is different from both an indicating level of a utilized amount of the developing apparatus according to the utilized amount of the developer carrying member detected by the first detection device and an indicating level of a utilized amount of the developing apparatus according to the remaining amount of the developer detected by the second detection device.

Amended independent Claim 11 is a control method for an image forming apparatus generally formulated on the basis of amended Claim 6.

The invention recited in amended Claims 6 and 11 is characterized in that in a case that the utilized amount of said developer carrying member detected by the first detection device is equal to or less than a predetermined amount, and the remaining amount of the developer detected by the second detection device is equal to or more than a predetermined level, the indicating level of a utilized amount of said developing apparatus determined by

the processing unit is different from both an indicating level of a utilized amount of the developing apparatus according to the remaining utilized amount of the developer carrying member detected by the first detection device and an indicating level of a utilized amount of the developing apparatus according to the remaining amount of the developer detected by the second detection device.

In contrast, Matsumoto, et al. discloses detecting means which detects a remaining developer amount contained in a cartridge used in an image forming apparatus. For example, Matsumoto, et al. discloses detecting a remaining developer amount by both calculating a cumulative time in which laser light is emitted from exposure means and measuring a capacitance between an electrode provided on the cartridge and a developing roller. However, Matsumoto, et al. does not disclose or suggest that in a case that the first remaining amount of the developer presumed by a first detection device is equal to or less than an amount defined as a predetermined amount, and the second remaining amount of the developer detected by a second detection device is equal to or more than a predetermined amount, where the indicating level is determined (i) by the processing unit of a remaining amount of the developer in the developing apparatus so that the indicating level is different from both an indicating level according to the first remaining amount of the developer by the first detection device and an indicating level according to the second remaining amount of the developer detected by the second detection device (Claims 1 and 5); or (ii) by the processing unit is different from both an indicating level of a utilized amount of the developing apparatus according to the utilized amount of the developer carrying member detected by the first detection device and an indicating level of a utilized

amount of the developing apparatus according to the remaining amount of the developer detected by the second detection device (Claims 6 and 11).

It is respectfully submitted that Matsumoto, et al. does not disclose expressly-claimed features recited in amended independent Claims 1, 5, 6, and 11 and does not anticipate the claimed invention.

The other art is cited for allegedly disclosing salient features recited in the dependent claims. However, it is respectfully submitted that the other art does not overcome the deficiencies of Matsumoto, et al. *vis-à-vis* the invention recited in independent Claims 1, 5, 6, and 11.

Mukohara discloses an apparatus having a toner detecting apparatus, which detects a remaining toner amount by a penetration light amount and detects a remaining toner by an antenna to detect capacitance. In Mukohara, the antenna is used in the case that a remaining toner amount is from 50% to 100% of a predetermined amount, while the penetration light amount is used in the case that a remaining toner amount is less than 50%. It is respectfully submitted that Mukohara fails to disclose the above-described claimed features of the present invention.

Abe, et al. discloses detection of a remaining toner amount by measuring a capacitance with a plurality of detecting members (electrodes) on a process cartridge and storing a detected value into a memory provided on the process cartridge. It is respectfully submitted that Abe, et al. also fails to disclose the above-described claimed features of the present invention.

Fukui discloses control of toner density in an image forming apparatus by using a reference value. Fukui also discloses that the reference value is corrected based on a

consumption amount of toner by measuring a consumption amount of toner per sheet based on image data. It is respectfully submitted that Fukui also fails to disclose the above-described claimed features of the present invention.

Otomo, Sakurai, Koizumi, and Sakai discloses that remaining toner is detected by a detecting member.

Otomo discloses detecting a remaining amount of toner in a cartridge based on a capacitance detected by antennas provided on a cartridge in an image forming apparatus.

Sakurai discloses a plurality of antennas provided in a cartridge used in an image forming apparatus. In Sakurai, a remaining toner amount is obtained by measuring a capacitance with the plurality of antennas. Sakurai also fails to disclose the above-described features of the present invention.

Koizumi discloses a first antenna provided on an agitating member for agitating toner in a process cartridge and a second antenna provided in a toner cartridge used in an image forming apparatus. In Koizumi, a remaining toner amount is measured with the first antenna and the second antenna. Koizumi also fails to disclose the above-described features of the present invention.

Sakai discloses that remaining toner is detected with a plurality of electrodes provided in a process cartridge used in an image forming apparatus. Sakai also fails to disclose the above-described features of the present invention.

Kawai and Sakemi discloses a toner supply, which is controlled by detecting a density of a two-component developer.

Kawai discloses control of a developing bias to a supply toner based on a detection result from a sensor to detect a density of toner which is provided in developer in a

developing device of an image forming apparatus. Kawai also fails to disclose the above-described features of the present invention.

Sakemi discloses an image forming apparatus to form an image with two-component developer having toner and carrier. In Sakemi, a first sensor detects first information corresponding to toner density and a second sensor detects second information corresponding to the density of a two-component developer. Toner is supplied according to the outputs of the first sensor and the second sensor. Sakemi also fails to disclose the above-described features of the present invention.

It is also respectfully submitted that the combination rejections are not well founded. The Examiner has provided a *rationalization* for combining the teachings of the cited art based on the benefits of doing so. A combination rejection is proper only when there is some suggestion or motivation in the cited art *per se* to cause one having ordinary skill in the art to combine the teachings of the cited art. There is nothing in the cited art which supports the position that it can be combined in the manner suggested. Even if the art could be so combined, the mere fact that the art can be combined is not sufficient if there is no suggestions in the art that such a combination is desirable. For example, see ACS Hospital Systems, Inc. v. Montefiore Hospital, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984).

In view of the foregoing, it is respectfully submitted that independent Claims 1, 5, 6, and 11 are allowable over the cited art whether taken individually or in combination.

Dependent Claims

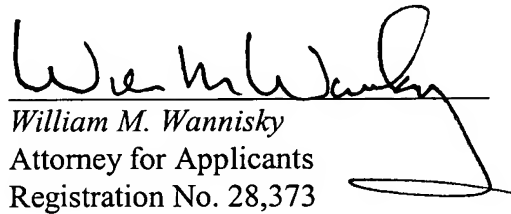
Claims 2 through 4 and 7 through 10 depend either directly or indirectly from one of Claims 1 and 5 and are allowable by virtue of their dependency and in their own right

for further defining Applicants' invention. Individual consideration of the dependent claims is respectfully requested.

It is respectfully submitted that the pending claims are allowable over the art of record and that the application is in condition for allowance. Favorable reconsideration and early passage to issue of the present application are earnestly solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our New York office at the address shown below.

Respectfully submitted,


William M. Wannisky
Attorney for Applicants
Registration No. 28,373

FITZPATRICK, CELLA, HARPER & SCINTO
30 Rockefeller Plaza
New York, New York 10112-3801
Facsimile: (212) 218-2200

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